**Enteric Enterics (Entero family with Enteric Location of Infection)**

**3 Types of Diarrhea**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Secretory | Hemorrhagic Colitis | Dysentery |
| Stools | Copious, watery  (no RBC/WBC) | Copious, like liquid blood  (no WBC) | Low volume, blood, mucous  (maybe WBCs) |
| Fever |  |  | + |
| Tissue Invasion |  |  | + |
| Site | SI | Colon | Ileum/Colon |

**Escherichia Coli**

* Most abundant anaerobe facultative anaerobe in normal feces | most avirulent + symbiotic
* 5 pathotypes that cause diarrhea + 2 that cause other diseases
* Distingushing serotypes: O (LPS) | H (flagellin) | K (capsule)

**Enteropathogenic E. Coli (EPEC)**

* Epi: Outbreaks of diarrhea in nurseries (mainly infants <1 yr old)
* Sym: Diarrhea – Watery ← NOT caused by secreted exotoxins
* Pathophysiology

1. Bacteria bind loosely via a fimbrial adhesion (Bfp)
2. Alters actin polymerization of microvilli → effacing toxin
3. Bacteria binds tightly via intimin, which binds Tir
   1. This internalizes the surface aquaporins → ↑H2O in feces
   2. Proteins also break down tight jxns → ↑H2O into feces

**Enterohemorrhagic E. Coli (EHEC)**

* Epi: Most common serotype: O157:H7 | Most are sorbitol-NONfermenting
* R: Cattle, esp in Western countries | Undercooked meat | Underpasteurized liquid| Person-person spread
* Sym: Diarrhea – Copious; Blood-like → Hemolytic-Uremia Syndrome (HUS)
  + MOST common form of acute renal failure
  + HUS
    - Treatable, but serious (5-10% mortality)
    - Begins days/weeks after gastroenteritis
    - Associated w/ damage to renal glomerular endothelium by toxins
    - Sym: Pentad – Fever | Thrombocytopenia | Hemolytic Anemia w/ Schistocytes (odd-looking erythrocytes) | Acute renal failure | Variable CNS symptoms
    - T: Supportive care w/ blood transfusion | Control of electrolytes/H2O imbalance | Dialysis
* Patho: Grows in terminal regions of colon (multiplies locally) | Damages blood vessels (via Shigalike toxins)
* T: Avoid antibiotics if possible | Oral rehydration | Treat disease complications
* Pre: Clean H2O | Wash hands | Handle food properly

**EAHEC**

* EACH + Stx from EHEC → New deadly strain

**S. enterica serovar Typhi (Salmonella Typhi)**

* 4 clinical syndromes (plus carrier states)
  + Gastroenteritis
    - Epi: From chicken, eggs + dairy products | Summer
    - Sym: N/V/Diarrhea (watery)
    - T: Don’t typically use antibiotics
  + Focal infection of the vascular endothelium
  + Infection of particular organ systems
    - Osteomyelitis in sickle cell patients
  + Typhoid fever
    - Epi: Human carrier | Fecal-Oral transmission
    - T: Use FQs to ↓ illness + eradicate organism
* Pathogenesis

1. Travel through to distal ileum + colon
2. Attach + Penetrate mucosal barrier
3. Invasin → Phagocytosis (causes a characteristic ruffling)
4. Pass into blood → transient bacteremia
5. Carried into regional lymph nodes, liver, spleen
6. Enters macrophage + begins to multiply
7. Once threshold reached, bacteria released into bloodstream → Continuous bacteremia
   1. Symptoms begin | Invades gallbladder, kidney, gut mucosa
   2. Endocarditis + Vascular Infection

* D: Growth on specific media | Serology

**Yersinia enterocolitica**

* Leading cause of acute bacterial gastroenteritis
* Pathogenesis

1. Invasive in the ileum
2. Multiplication in Peyer’s patches
3. Cause tissue damage
4. Drainage → Bacteremia → 35-50% mortality

* Epi: Mostly in children | Thru contaminated food, H2O | Ubiquitous
* Cannot chelate iron, uses other bacteria stores
* Can grow at 4° C (so even when refrigerated)
* Mimics appendicitis